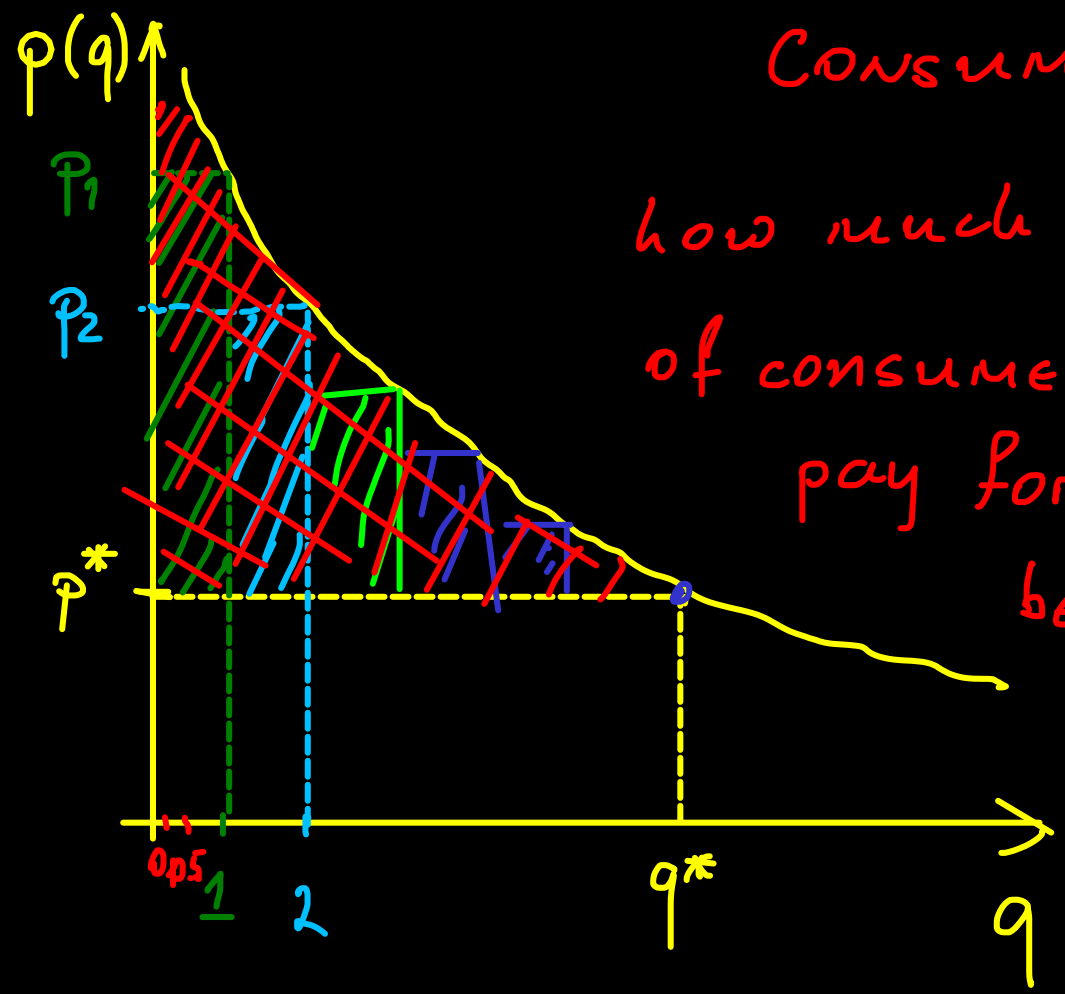


- willing to pay p_1 , pays $p^* \Rightarrow$ "surplus" = $(p_1 - p^*) \times 1$



Consumer surplus:

how much is the "society" of consumers willing to pay for being able to be in a market for the good where the price is p^*

$$\begin{aligned}
 &+ (p_1 - p^*) \times 1 \\
 &+ (p_2 - p^*) \times 1 \\
 &+ (p_3 - p^*) \times 1 \\
 &+ (p_4 - p^*) \times 1 \\
 &\vdots \\
 &+ (p^* - p^*) \times 1
 \end{aligned}$$

$$CS = \int_0^{q^*} p(q) dq - \int_0^{q^*} p^* dq$$

Example:

$$p(q) = 100q^{-1/2}$$

$$\text{and } p = 10 \Rightarrow q = 100$$

$$CS = \int_0^{100} \underbrace{100q^{-1/2}}_{\frac{d}{dq}[200q^{1/2}]} dq - \int_0^{100} \underbrace{10}_{\frac{d}{dq}(10q)} dq = [200q^{1/2}]_0^{100} - [10q]_0^{100}$$

$$= (200 \times 100^{1/2} - 200 \times 0^{1/2}) - (10 \times 100 - 10 \times 0) = 1000$$

$$\boxed{CS = 1000}$$